



The Impact of Nurse-Physician Collaboration on Critical Care Nurses' Autonomy

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Abstract. Critical care environment is challenging where nurses and physicians should work with the highest degree of collaboration to achieve better outcomes. That comes in along with maintaining the autonomy of healthcare professionals. Nurses, the largest workforce in healthcare systems, struggle to maintain their professional autonomy. The purpose of this study was to investigate the potential effects of nurse-physician collaboration on nurses' autonomy.

A descriptive, correlational, cross-sectional design was used. Critical nurses (N = 131) from two governmental hospitals in Jordan participated in the study through an online self-report questionnaire. The results show that moderate levels of nurse-physician collaboration (M = 4.44/7.0 SD = 1.6), and moderate levels of autonomy (M = 2.88/4.0 SD = 0.54) were perceived among critical care nurses in Jordan. The result also shows moderately positive relationship between nurse-physician collaboration and perceived autonomy among nurses ($r = 0.431$, $p < 0.001$). Working on promoting nurse-physician collaboration is found to be among the factors to enhance nurses' autonomy which may lead to better healthcare outcomes in terms of patient care, increased nurses' job satisfaction.

Keywords: Nurse-Physician Collaboration · Autonomy · Nurses · Critical Care · Jordan

1 Introduction

Globally, there is a significant shortage of nurses, which is expected to worsen as forecasted by World Health Organization (WHO) that about nine million nurses and midwives will be required by 2030 [1]. To create a sustainable workforce, more nurses must be recruited and retained in the profession where different organizational and individual factors play a role to achieve that, such as financial rewards and various intangible rewards related to working conditions and relationships [2].

The situation gets more challenging in the complex healthcare environment of the Intensive Care Units (ICUs); where many factors play an integral role to enhance the

quality of care [3]. This includes collaborative efforts among nurses and healthcare team members to enhance patients' outcomes especially in critical care units. It was where patients are in need for a team approach [3]. Although there was a great need for the team approach of the group of nurses, but there was a shortage of nurses that reduces the team approach and collaborative efforts.

Baggs and colleagues [4] defined nurse-physician collaboration as "nurses and physicians working together, sharing responsibility for problem solving and making decisions to formulate and carry out plans for patient care". Nonetheless, and despite the many studies conducted on the concept, nurse's autonomy was not fully understood and a comprehensive explanation of this concept in nursing was still required [5]. Clinical autonomy and professional autonomy are two very common categories of nursing autonomy. Clinical autonomy of staff nurses who provide direct patient care, and it refers to their capacity to act further than conventional practice and make choices about individual patients' treatment [6]. Professional autonomy refers to either the profession as a whole or to nurses. It has been defined as "Involvement in judgment regarding individual patients' care and, more comprehensively, the advancement of patient care to allow for higher quality of nursing care and patient safety" [7]. Other recognized elements include the ability to affect working conditions and environments. It is said to be related to work significance, which was supported by autonomy in conducting and planning work, clinical decision-making, and the freedom to execute nursing work according to nurses' own judgment [2]. Professional autonomy was defined as "a nurse's capacity, right, and duty to make and implement decisions about patients' needs, as well as the freedom to execute their principles" [8].

Overall, while nurses seem to have more positive views toward collaborative efforts than physicians, they frequently evaluate the amount of collaboration they have in their units as lower. Power disparities between nurses and physicians, as well as constraints in nurses' autonomy; have been identified as major obstacles to collaboration [3]. This study aims at studying the relationship of nurse-physician collaboration with the perceived professional autonomy among critical care nurses in Jordan.

2 Methods

2.1 Design

Descriptive, correlational, cross-sectional design was used to collect critical care nurses' responses using an online self-report questionnaire.

2.2 Setting

All critical care nurses working at accessible governmental hospitals under the management of the Jordanian Ministry of Health (MOH) were targeted at the current study. Ministry of health institutions provides the needed health care services at all levels for the majority, about 60%, of the population in Jordan. For accessibility to reach the targeted study population and to maintain a reasonable homogeneity of the setting, the largest main tertiary hospital at the two main cities within the central region of Jordan were targeted at the current study.

2.3 Sampling

The sample size was calculated using a power analysis procedure described by Cohen [9]. Considering a medium size effect, power of .8, and a significance level of $\alpha = .05$ as it is the most widely used in nursing research [10], the sample size was calculated to be 107 critical care nurses, using linear regression as the highest level of statistical procedures to be used. All registered nurses who work at any critical care unit at the targeted hospitals with a minimum one year of experience were invited to participate in the study. Licensed practical nurses and nurses working at non-critical care areas were excluded from the study.

2.4 Data Collection Procedure

Data was collected using an online self-report questionnaire. The principal investigator built the data collection tool using a commercially available form (e.g. Google Forms®). After obtaining the needed approvals, the principal investigator visited all the critical care units at both hospitals and presented to the unit managers and available staff on duty on each visit about the study purpose, significance, roles and responsibilities of participants, assurance of voluntary participation, and the right to withdraw from the study at any time, and maintenance of confidentiality and privacy of data of the responses.

After that, the link for the online questionnaire was shared with the unit managers in order to share it with the interested staff members internally using their internal communication groups. An introductory paragraph on the online form confirmed the purpose of the study, participants' rights and roles in the study, and inclusion criteria, as well as a statement of consent to participate. Then, the responses were extracted, analyzed and reported.

2.5 Instrumentation

Data collection was conducted using critically selected valid and reliable tools. Initially a demographics section that was constructed by the principal researcher to collect the needed data to define the study sample and as it relates to the study main variables. The demographics sections collect data about participants' age, gender, years of experience, unit of work, hospital type.

For nurse-physician collaboration variable, Collaboration About Care Decisions Scale (CSACD) developed by Bagges was used [11]. CSACD consist of 10-item Likert type scale. For nurses' professional autonomy variable [8], professional autonomy scale was used. It is an 18-item Likert type scale.

3 Results

3.1 Sample Characteristics

As shown in Table 1, that the number of participants in the study was (131), where most of the respondents were females with 64.9% $n = 85$, and the average age of the participants was around 37 years of age $SD = 7.78$ with the highest age group percentage

(25–35 year) 46.6% $n = 61$. About 57.3% ($n = 75$) of the participants have (more than 10 years) years of experience in nursing by mean 13.53 and SD 8.13. And about 50.4% $n = 66$ of the participants have (1–5 years) years of experience in critical care by mean 7.52 and SD 7.14. More than half of the participants ($n = 122$, 93.1%) have bachelor's degree level of education. The number of sample study work in adult ICU reached $n = 90$, 68.7%, and work in Pediatric ICU reached ($n = 41$, 31.3%).

As shown in Table 2, the mean for general level of nurse-physician collaboration scale items ranged between 4.809 and 4.275. The highest mean for the item number 1 “Nurses and physicians planned together to make the decision about care for this patient”, while the lowest mean for item number (4) “Physicians and nurses cooperated in making the decision”. The overall scale mean was 4.44 which is considered to be “moderate” This indicates that the levels of nurse-physician collaboration among critical care nurses in Jordan is at the “moderate” level which satisfies the inquiry in research question number one. The resulted Cronbach's alpha of the Collaboration and Satisfaction about Care Decisions scale was 0.958 which is high value.

To find the general level of perceived professional autonomy among nurses at the critical care units in Jordan, means and standard deviation of the general level of perceived professional autonomy were calculated as shown in Table 3. The mean for professional autonomy scale domains ranged between 2.875 and 2.782. The highest mean for the

Table 1. Descriptive statistics of the socio-demographics (N = 131)

Variable	Categorical	%(n)
Hospital name	Zarqa Hospital	42.7(56)
	AL Basheer Hospital	57.3 (75)
Age	less than 25 year	7.6(10)
	25–35 year	46.6(61)
	more than 35 year	45.8(60)
Gender	Male	35.1(46)
	Female	64.9(85)
Years of experience in nursing	1–5 years	19.1(25)
	6–10 years	23.7(31)
	More than 10 years	57.3(75)
Years of experience in critical care	1–5 years	50.4(66)
	6–10 years	29.8(39)
	More than 10 years	19.8(26)
Academic level	Bachelor	93.1(122)
	Master	6.9(9)
Unit of work	Adult ICU	68.7(90)
	Pediatric ICU	31.3(41)

Table 2. Levels of Nurse-Physician Collaboration Scale

Item number	Item	Mean (SD)	Interpretation of score
1	Nurses and physicians planned together to make the decision about care for this patient	4.809(1.836)	Moderate
2	Open communication between physicians and nurses took place as the decision was made for this patient.	4.565(1.794)	Moderate
3	Decision-making responsibilities for this patient were shared between nurses and physicians	4.282(2.062)	Moderate
4	Physicians and nurses cooperated in making the decision.	4.275(1.930)	Moderate
5	In making the decision, both nursing and medical concerns about this patient's needs were considered.	4.527(1.966)	Moderate
6	Decision-making for this patient was coordinated between physicians and nurses	4.443(1.819)	Moderate
7	How much collaboration between nurses and physicians occurred in making the decision for this patient?	4.321(1.684)	Moderate
8	How satisfied are you with the way the decision was made for this patient, that is with the decision-making process, not necessarily with the decision itself?	4.473(1.786)	Moderate
9	How satisfied were you with the decision made for this patient?	4.321(1.684)	Moderate
Scale overall		4.446(1.593)	Moderate

domain “value base of autonomy”, while the lowest mean was for domain “Knowledge base of autonomy”. The overall scale mean was 2.827 which is “moderate” This indicates that the level of perceived professional autonomy among nurses at the critical care is at the “moderate” level which satisfies the inquiry in research question number one. The resulted Cronbach’s alpha of the professional autonomy scale was 0.961 which is high value.

Table 3. Levels of Professional Autonomy and its Subscales

Item number	Domain	Mean (SD)	Interpretation of score
1	Knowledge base of autonomy	2.782(0.592)	Moderate
2	Action base of autonomy	2.823(0.613)	Moderate
3	Value base of autonomy	2.875(0.530)	Moderate
Scale overall		2.827(0.547)	Moderate

Means, and standard deviations were also calculated for “knowledge” base of autonomy domain items were calculated. It ranged between 2.997 and 2.618. The highest mean for the item number 6 “I’m responsible for developing my knowledge base”, while the lowest mean for item number (1,2) “I can make independent decision concerning patient care in my unit”, “I can make independent decision concerning my units’ operation”, by moderate level.

Means and standard deviations were also extracted for “Action” base of autonomy domain items were calculated. It ranged between 2.954 and 2.679. The highest mean for the item number 2 “I can take independent action to organise units operations”, while the lowest mean for item number (5) “I’m responsible for the progress of patient care”, by moderate level.

Means and standard deviations for “Value” base of autonomy domain items were calculated. It ranged between 2.908 and 2.832. The highest mean was for the items number (4 and 5) “I have the right to participate in value base in the unit” “I’m responsible for carrying out my own values in my job”, while the lowest mean was for item number (3) “I have the right to participate in value discussions concerning patients”, by moderate level.

3.2 Relationship Between Nurse-Physician Collaboration and Nurses’ Autonomy

Pearson correlation between nurse- physician collaboration and the perceived professional autonomy was calculated using SPSS. The results of coefficient correlation between (professional autonomy scale and Collaboration and Satisfaction about Care Decisions) reached ($r = 0.431$, $p < 0.001$) which reflects a positive moderately strong relationship between the two variables (Powers, 2020).

3.3 Differences Among Groups of Nurses

As shown in Table 4, independent samples t-test was used to test the differences among female and male nurses groups. The value of (t) for the Collaboration and Satisfaction about Care Decisions scale according to the gender variable reached (-0.966), which is not statistically significant value at the level of significance ($\alpha \leq 0.05$), and this indicates that there are no statistically significant differences on Collaboration and Satisfaction about Care Decisions scale according to the gender variable. The value of (t) for the (professional autonomy scale) according to the gender variable reached (3.642), which is

statistically significant value at the level of significance ($\alpha \leq 0.05$), and this indicates that there are statistically significant differences on professional autonomy scale according to the gender variable, where these differences were in favor of (Male).

As shown in Table 5, the value of (F) for the (professional autonomy) scale according to the (years of experience in nursing) variable reached (2.137), which is not statistically significant value at the level of significance ($\alpha \leq 0.05$), and this indicates that there are not statistically significant differences on (professional autonomy) scale according to the (years of experience in nursing). Also, the value of (F) for the (Collaboration and Satisfaction about Care Decisions) according to the (years of experience in nursing) variable reached (14.449), which is statistically significant value at the level of significance ($\alpha \leq 0.05$), and this indicates that there is statistically significant differences on the (Collaboration and Satisfaction about Care Decisions) according to the (years of experience in nursing).

To know in favor of these statistically significant differences; Scheffe's test was used for dimensional comparisons, the results of which are shown in Table (15). The results shows that there is a statistically significant difference at the level of statistical

Table 4. Nurse-Physician Collaboration and Autonomy by Gender

Scale	Variable	Mean	t	df	p
Collaboration and Satisfaction about Care Decisions	Male	4.263	-0.966	129	0.336
	Female	4.545			
Professional autonomy	Male	3.053	3.642	129	0.000*
	Female	2.705			

Table 5. Nurse-physician collaboration and Autonomy according to years of experience in nursing

Scale		Sum of Squares	Df	Mean Square	F	Sig.
Collaboration and Satisfaction about Care Decisions	Between Groups	60.784	2	30.392	14.449	0.000*
	Within Groups	269.240	128	2.103		
	Total	330.024	130			
Professional autonomy	Between Groups	1.257	2	0.628	2.137	0.122
	Within Groups	37.636	128	0.294		
	Total	38.893	130			

* Statistically significant value at the level of significance ($\alpha \leq 0.05$)

significance ($\alpha \leq 0.05$) between the mean of the estimates of the study sample individuals in the (Collaboration and Satisfaction about Care Decisions) scale according to years of experience in nursing, where it was between level (more than 10 years and 1–5 years) were in favor of the level (more than 10 years), and between (more than 10 years and 6–10 years) were in favor of the level (more than 10 years).

3.4 Predictors of Critical Care Nurses' Autonomy

Multiple regression analysis was used between the independent variables (gender, years of experience in nursing, and Collaboration and Satisfaction about Care Decisions) and dependent variable (professional autonomy). Coefficient of determination (R^2) was (0.185), and the value of the modified coefficient of determination (Adjusted R^2) was (0.179), which indicates that the independent variables (gender, years of experience in nursing, and Collaboration and Satisfaction about Care Decisions) was able to explain about 18% of the changes occurring in nurses' autonomy.

As shown Table 6, the value ($F = 12.569$) and statistically significant (0.00) is less than the level of statistical significance ($\alpha \leq 0.05$). Thus, a multiple linear regression model is suitable for measuring the causal relationship between the independent variable (age, gender, years of experience in nursing, years of experience in critical care, Collaboration and Satisfaction about Care Decisions) and dependent variable (professional autonomy). A summary of the Model Summary analysis of multiple linear regressions. Also, there is a statistical significance for the coefficient of multiple linear regression equation related to the independent variables (gender, years of experience in critical care, Collaboration and Satisfaction about Care Decisions), where the value ($t = -5.100, 2.015, 6.389$) respectively, which shows the impact of the effect of (gender, years of experience in critical care, Collaboration and Satisfaction about Care Decisions) on professional autonomy. Thus, there are significant significance for the coefficient of multiple linear regression equation, which were (-0.397, 0.184, 0.533) respectively. Moreover, there is no statistical significance for the coefficient of multiple linear regression equation related to the independent variable (age, years of experience in nursing) and dependent variable (professional autonomy).

Table 6. The results for multiple regressions

F	df	Sig*	Regression coefficients				
			Domain	β	Std. Error	t	Sig*
12.569	125	0.00*	Gender	-.397	.089	-5.100	.000*
			Years of experience in nursing	.065	.068	.663	.508
			Collaboration and Satisfaction about Care Decisions	.533	.029	6.389	.000*

* Statistically significant at the level of statistical significance ($\alpha \leq 0.05$)

4 Discussion

The levels of nurse-physician collaboration between critical care nurses in Jordan are at the “medium” level, which is a good level, but we need to raise it in order to improve the quality of services provided to patients. The results of this study are in agreement with the following studies that indicate that intermediate levels of nurse-physician collaboration among critical care nurses, such as the study [12] evaluated the mediating role of nurse-physician collaboration in the relationships between nurses’ work environment, and determine the outcomes of patient safety and job satisfaction. It found that the level of collaboration between Physician and nurses, which indicated an average level of nurse-physician collaboration which must be increased to improve the level and quality of service provided to patients.

The level of perceived professional autonomy among critical care nurses is at the ‘intermediate’ level, with a median range of professional autonomy. The current study results indicated that critical care nurses are responsible for developing their own knowledge base and also cannot make an independent decision about patient care in a health care unit or can make an independent decision about the operation of special units. Therefore, professional roles in nursing must be expanded in order to improve autonomy by giving nurses more decision-making power. In order to expand roles, nurses must reflect on their career goals and establish a personal nursing philosophy and professional development plan. Nurses’ autonomy must be improved in order to improve the quality of nursing care, patient outcomes, and the sustainability of health care facilities [13].

The results of the current study agreed with a study (Suominen et.al, 2013) in Finland examining experiences of autonomy working with Finnish ICU nurses where most respondents considered them to have greater autonomy in decision-making, decisions and tasks related to general patient care compared to tasks related to ICU Intensive care hospital Also, has Labrague et al. [13]. A study in the Philippines that examined the level of occupational autonomy, as well as its predictors and outcomes, among ICU nurses, showed moderate levels of occupational autonomy, with hospital bed capacity and education as strong predictors).

The relationship between nurse-physician collaboration and perceived professional autonomy was significantly and positively correlated with ($r = 0.431$, $p = 0.00$) with moderate positive correlation at the current study. Parizad and colleagues [14] did find a significant relationship between a nurse’s professional autonomy and nurse-physician collaboration. The results also concur with the findings by [15]. The relationship between nurse-physician collaboration and professional autonomy has been significantly and positively observed in Jordan where the establishment of effective professional collaboration between nurses and physicians is essential given their key roles in patient care and treatment. Evidence suggests that nurse-physician collaboration is a key factor in improving disease outcomes including mortality, readmission, and disease complications. In order to improve this relationship, nurses’ contribution to clinical decision-making and their input into decisions at the unit and organization level must be specifically targeted with the development, implementation and support of effective collaboration between nurses and clinicians. It also explored different approaches to enhancing cooperation in hospitals in Jordan for better patient outcomes and economic gains [14, 15].

The statistically significant differences on the scale of professional autonomy according to the gender variable, were in favor of (males), and this means that the professional autonomy is greater for males than for females, and the reason may be that males have the ability to make decisions more than females. Maharmeh [16] study in Jordan described the experiences of Jordanian critical care nurses in autonomy in their clinical practice, indicated that their autonomy in work and acquired knowledge was affected by a number of factors such as gender and field of practice.

There current study results showed that there are no statistically significant differences on the scale (professional autonomy) according to (years of nursing experience). Galdikiene and colleagues [17] also reported significant differences were found in the measure of professional autonomy according to years of nursing experience, where the results of a study indicated that years of experience affect professional autonomy, but [18] showed there are no statistically significant differences on the scale Professional autonomy according to years of nursing experience, and this result is consistent with the results of the current study.

There current study results showed that there was a statistically significant differences in (collaboration and satisfaction with care decisions) according to (years of nursing experience). Mohamed et al., [19] in Egypt, aimed to determine the relationship between nurse/ physician collaboration cooperation and professional autonomy in nursing is agreed, they indicated that the collaboration between nurses and physician is affected by the level of expertise, the more experience the nurses have, the greater the collaboration between them and the physician will be. There are several factors that affect the relationship between nurses and physicians and the autonomy of nurses, which must be taken into account to increase cooperation between nurses and Physician because it has a positive impact on the quality of services provided to patients and also enhances the autonomy of nurses in order to make the right decisions in a timely manner that will save patients namely, years of nursing experience and cooperation between nurses and doctors. The doctor, because with the long experience, the nurse will be more understanding of her work and more likely to understand the doctor's decisions and know the importance of cooperation between them in order to provide better service to patients.

4.1 Study Limitations

Despite the study strengths, in the appropriateness of study design to purpose, and homogeneity of study setting, the results of this study are subject to several limitations. First, the study used a cross-sectional descriptive design that would limit the generalizability of the study results and the generation of any causal inferences. Second, the results are subject to self-report bias as we collected data via a self-administered questionnaire. Third, the study participants included intensive care nurses in government hospitals in Jordan, while other healthcare sector scan be invited to participate.

4.2 Conclusions

The results of this study indicate an average level of nurse-physician collaboration and an average level of professional independence among nurses in the critical care unit in Jordan. To improve the state of independence for nurses, their participation in the

clinical decision should be one of the goals of every organization. In addition, educational interventions to promote a critical thinking approach can help improve the professional independence of the nurse.

In addition, given the importance and need for collaboration between physicians and nurses to improve patient outcomes, it is necessary to use a variety of approaches, such as training workshops on ways to improve communication and the use of group tours in medical centers. Promoting nurses' autonomy from patient care and patient unity Operations lead to positive outcomes for nurses and patients such as increased nurses' job satisfaction and patient satisfaction, and thus autonomy lead to positive outcomes for healthcare organizations. Nurses report that they have moderate autonomy about some aspects of patient care decisions. Jordanian nurses should be given greater autonomy in decisions regarding patient care. Organizations can implement various interventions to enhance nurses' autonomy; No matter how comprehensive and primary the intent is the implementation of shared governance that aims to expand the roles and responsibilities of nurses. Also, this can be achieved in a participatory management style.

4.3 Recommendations

The results of the current study have important implications for nursing practice, and in light of the results obtained from the current study, these points are recommended:

1. Empowering nurses with adequate powers to implement hospital policies
2. Providing a well-planned orientation program for physicians and nurses, which covers health team member roles, policies and procedures. Officials must be fair and apply disciplinary measures on an equal basis with nurses and physician.
3. Providing a collaborative environment across disciplines as a vital part of the health care organization's development to enhance nurses' performance as well as improve patient safety climate.
4. Provide a useful training strategy to enhance the work of nurses and physician together and to recognize the autonomy and competence of each profession before hospitalization
5. Enhancing nurses' autonomy by enabling them to exercise clinical decision-making, first in safe environments, such as nursing rounds, and then by creating multi-professional teams. Actively support nursing decisions and hold nurses accountable.
6. Providing the opportunity for the nurses to participate in the treatment plan and the patient's discharge with the physician.
7. Developing an educational program on nurse-physician collaboration for new nurses.
8. Increasing the practical training of nurses during their studies to enhance their professional autonomy.
9. Improving the relationship, collaboration and communication between physician and nurses through participation in conferences and seminars, as well as continuing educational participation, in service programs and workshops especially with a focus on collaboration and communication.

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